



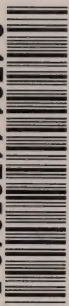
Industry Canada

Industrie Canada

Government
Publications

CAI
IST5
-1996
A74

3 1761 11765013 5



SECTOR COMPETITIVENESS FRAMEWORKS


AUTOMOTIVE INDUSTRY

PART 1 – OVERVIEW AND PROSPECTS



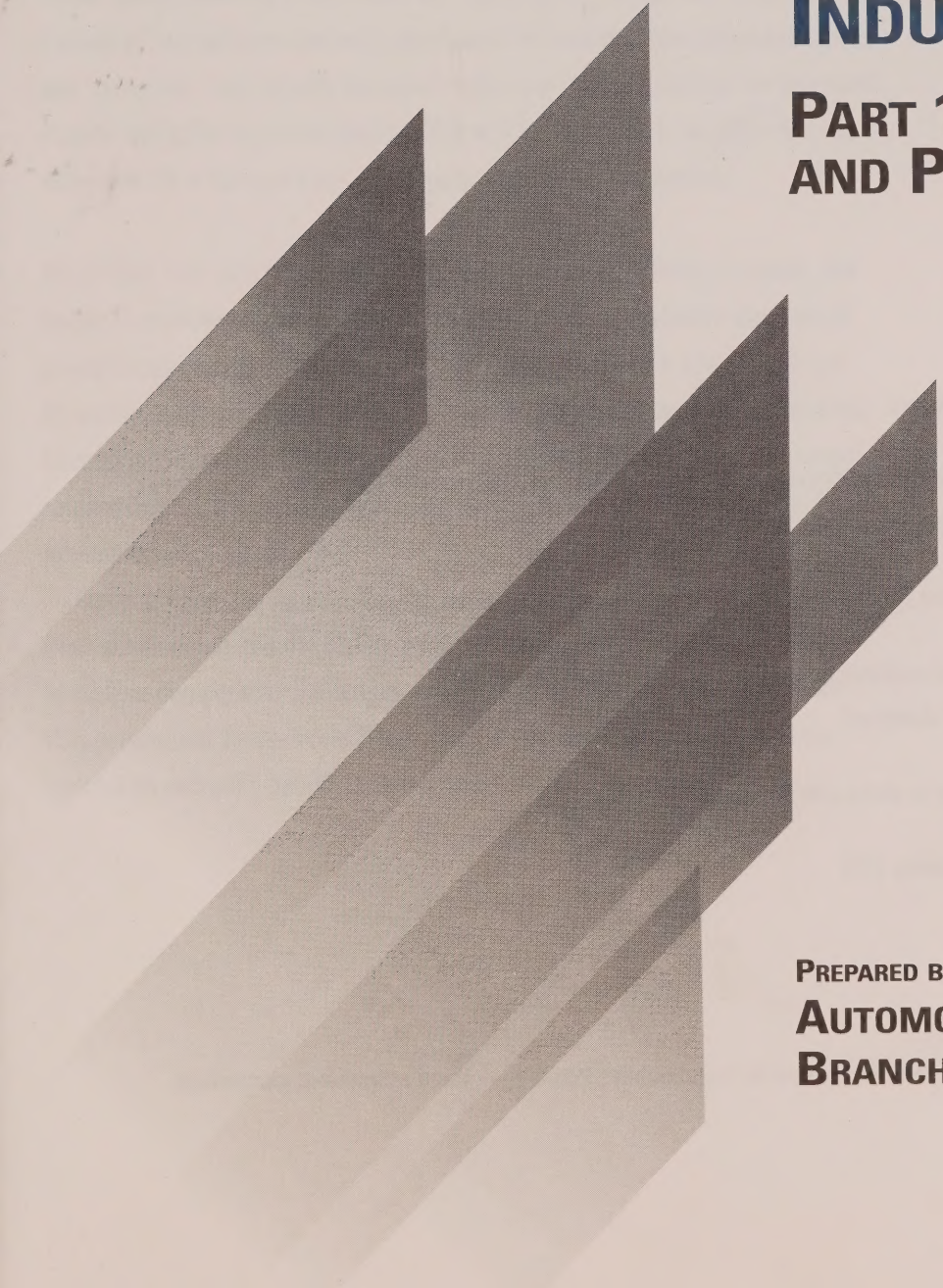
Industry Sector *Secteur de l'industrie*
Automotive *Transport routier*

Canada



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

<https://archive.org/details/31761117650135>



AUTOMOTIVE INDUSTRY

PART 1 – OVERVIEW AND PROSPECTS

PREPARED BY:
**AUTOMOTIVE
BRANCH**

This *Overview and Prospects* is the first of two companion documents on the Automotive Industry in the **Sector Competitiveness Frameworks** series, which is being produced by Industry Canada in partnership with Canada's key stakeholders in the industry. *Part 2 — Framework for Action* will be prepared in coming months, based on consultations with major industry stakeholders, following study and review of the *Overview and Prospects*.

The **Sector Competitiveness Frameworks** series will focus on the opportunities, both domestic and international, as well as on the challenges facing each sector. The objective is to seek ways in which government and private industry together can strengthen Canada's competitiveness and, in doing so, generate jobs and growth.

In all, some 29 industrial sectors will be analyzed. *Part 1 — Overview and Prospects* will be available for distribution in printed as well as electronic forms during coming months for the following industries:

Aircraft and Aircraft Parts
Automotive Industry
Bus Manufacturing
Consulting Engineering
Forest Products
Household Furniture
Petroleum Products
Plastic Products
Primary Steel
Rail and Guided Urban Transit Equipment

To order any document in the **Sector Competitiveness Frameworks** series, please send your request to us by Fax at (613) 941-0390 or by E-mail at order.commande@ic.gc.ca

To obtain additional information about the **Sector Competitiveness Frameworks**, please phone us at 1-800-390-2555

Electronic copies of this document are available on the Internet at the following address:

http://strategis.ic.gc.ca/automotive_industry.scf

This document can be made available in alternative formats upon request.

© Minister of Supply and Services Canada 1996

Cat. No. C21-22/14-1-1996E

ISBN 0-662-24852-X

Aussi disponible en français sous le titre : L'industrie de l'automobile : Partie 1 — Vue d'ensemble et perspectives.



FOREWORD

The new Canadian marketplace is expanding from national to global horizons and its economic base is shifting increasingly from resources to knowledge. These trends are causing Canadian industries to readjust their business approaches, and government must respond with new tools to help them adapt and innovate. Industry Canada is moving forward with strategic information products and services in support of this industry reorientation. The goal is to aid the private sector in what it is best qualified to do — create jobs and growth.

Sector Competitiveness Frameworks are a series of studies published by Industry Canada to provide more focussed, timely and relevant expertise about businesses and industries. They identify sectors or subsectors having potential for increased exports and other opportunities leading to jobs and growth. In 1996–97, they will cover 29 of Canada's key manufacturing and service sectors.

While they deal with “nuts and bolts” issues affecting individual sectors, the Sector Competitiveness Frameworks also provide comprehensive analyses of policy issues cutting across all sectors. These issues include investment and financing, trade and export strategies, technological innovation and adaptation, human resources, the environment and sustainable development. A thorough understanding of how to capitalize on these issues is essential for a dynamic, job-creating economy.

Both government and the private sector must develop and perfect the ability to address competitive challenges and respond to opportunities. The Sector Competitiveness Frameworks illustrate how government and industry can commit to mutually beneficial goals and actions.

The Sector Competitiveness Frameworks are being published sequentially in two parts. An initial *Overview and Prospects* document profiles each sector in turn, examining trends and prospects. The follow-up *Framework for Action* draws upon consultations and input arising from industry–government collaboration, and identifies immediate to medium-term steps that both can take to improve sectoral competitiveness.

CONTENTS

1 HIGHLIGHTS	1
2 KEY POINTS ABOUT THIS INDUSTRY	11
2.1 Global Context	11
2.2 North American Context	14
2.3 Canadian Automotive Sector Snapshot	15
2.4 Assembly Industry	19
2.5 Components Industry	27
3 CHANGING CONDITIONS AND INDUSTRY RESPONSE	35
3.1 Trade	35
3.2 Technology	36
3.3 Sustainable Development	38
3.4 Harmonization	39
3.5 Human Resources	40
3.6 Regulatory Reform	42
3.7 Market	43
3.8 Product Mandates	43
3.9 Distribution and Marketing	44
4 GROWTH PROSPECTS	45
4.1 Assembly Industry	46
4.2 Components Industry	48
4.3 The Bottom Line	49
ANNEXES	53
A How a Car is Produced	53
B Components Industry Restructuring	55
C Tariff Structure for Canada, the United States and Mexico, 1996	57
D Canadian Light Vehicle Assembly Plants	58

This automotive industry *Overview and Prospects* reviews key aspects of the context, characteristics, issues and prospects for the Canadian light vehicle assembly and automotive parts manufacturing industries. Heavy-duty trucks, buses and specialty vehicles are not addressed in this paper, nor is the retail and aftermarket sector.

Canada accounts for 16 percent of light vehicle production and 11 percent of parts production in North America. This positive performance can be attributed to many factors, including a highly trained work force, a barrier-free trade environment, high-quality products and a competitive micro-economic climate.

Canada's automotive shipments in 1995 were at a record level of \$71 billion. The 1995 annualized average direct manufacturing employment was 138 755. Total employment related to the sector, including retail and aftermarket parts manufacturers and distributors, was 501 970, up by 2.7 percent from the 1994 level of 488 854. Automotive trade accounts for about 23 percent of total Canadian merchandise trade. In 1995, Canada had a trade surplus in vehicles worth \$28.9 billion, and a trade deficit in parts worth \$20.2 billion. Annual Canada-U.S. trade in parts, subassemblies and vehicles is currently worth over \$100 billion. The automotive sector accounts for 11.5 percent of Canada's manufacturing gross domestic product (GDP) and 2.2 percent of total GDP. Data on value-added collected by Statistics Canada according to its 1980 Standard Industrial Classification (SIC) of industries at the three-digit level show

that automotive parts manufacturing in 1995 was Canada's largest manufacturing industry, and motor vehicle assembly was the fifth largest.

Major vehicle manufacturers such as Chrysler, Ford and GM (which are known as the Big Three automakers) as well as Honda, Suzuki, Toyota and Volvo produce cars in Canada in highly competitive facilities. Current production is 2.4 million light vehicles. Canadian parts manufacturers are world class, successfully competing in both the North American and increasingly global environment.

The Canada—U.S. light vehicle market is expected to remain stable to the end of the decade. However, there will be fluctuations within specific categories. For example, sport/utility vehicles, vans and light trucks are expected to be among the lead growth segments of the market. Canada is well positioned in these segments, given current mandates, and also produces many light vehicles that are bestsellers for North America.

Trade

By creating a conditional duty-free manufacturing environment, the 1965 Canada—U.S. Automotive Products Agreement (Auto Pact) fostered a high level of integration that has given rise to efficient world-scale plants in Canada benefiting from the best market access to the largest automotive market in the world. The rationalization resulting from the Auto Pact also allowed the Canadian parts industry to flourish. The North America Free Trade Agreement (NAFTA) among Canada, the United States and Mexico has extended the level of integration to Mexico, such that the total North American automotive manufacturing sector is approaching full integration. The automotive sector is unique in this regard.

The Canadian automotive sector operates in a global context dominated by three regional blocs: North America, Europe and Japan. With “regionalized production” (i.e. producing in each prime market area for the local market), trade among these blocs has been limited. However, as trade barriers are removed, the traditional North American producers (Chrysler, Ford and GM) are increasing exports to countries such as Japan. Also, as Japanese and European assemblers expand production in North America, the scale of exports from North America is increasing. This trend is expected to continue in the future. Opportunities for parts manufacturers are also increasing as assemblers “produce locally and source globally.” Many domestic parts manufacturers increasingly are becoming global suppliers.

Automotive manufacturing is a key contribution to all economies. Significant progress has been made in removing trade barriers between North America, Europe and Japan. Furthermore, there are ongoing initiatives to removing remaining barriers to trade. However, a number of countries are developing their automotive sector behind a variety of restrictive trade regimes. There is therefore a need to continue to press for the removal of such trade-distorting policies so that trade opportunities are maximized.

Technology

In the automotive sector, research and development (R&D), design and engineering activities are carried out mainly at their corporate headquarters in Europe, Japan (Tokyo) and the United States (Detroit, Michigan). Consequently, relative to the level in other industries, the amount of R&D conducted in Canada by assemblers is low. However, niche opportunities

exist, and the Big Three automakers have exploited some of these in Canada. For example, GM focusses on alternative fuels, Ford on aluminum technology and Chrysler, in alliance with the University of Windsor, on alternative fuels and design.

Additionally, Canadian assembly plants have total access to world-class product and process technology, most of which is imported from the parents' R&D facilities. Through the application of acquired technologies, these are diffused throughout the supporting sectors such as steel, machinery, advanced manufacturing technologies and so on. Greater responsibilities are being placed on suppliers by the original equipment (OE) manufacturers for systems development, and less complex parts production in Canada is being challenged by Mexican and offshore sources. Given these pressures, development of engineering, design and other technology development skills is critical to Tier Two parts manufacturers (operating on a "make to print" basis) that desire to become Tier One (systems supplier directly to OE manufacturers) suppliers as well as to Tier One manufacturers to maintain their competitive edge.

Human Resources

Labour training, the availability of skilled trades and labour-management relations are among the stakeholders' major concerns, since these issues have direct impact on the competitiveness of the Canadian automotive sector.

Labour training is crucial to higher labour productivity and a competitive labour force. As product cycles are shortened, there is increasing need for training to enable workers to adapt efficiently to new technology and/or reconfigured work environments. This situation provides an opportunity for the industry and government to work together to develop appropriate mechanisms to ensure that the needed skills are developed in the required time frame.

Currently, there is a domestic shortage of skilled trades required by the parts industry. The disequilibrium in this segment of the labour market causes efficiency losses, raises turnover rates and has a negative impact on product quality. In the absence of effective measures, the situation could deteriorate in the next five to ten years as many of the skilled trades people in the industry approach retirement age. Without the proper mix of skills required to develop subsystems for the OE manufacturers, the chance for interested parts manufacturers to become Tier One suppliers is reduced.

Cost-cutting pressures have led OE manufacturers to outsource an increased portion of parts from independent suppliers. At the same time, the labour unions are keen to preserve jobs in assemblers' parts operations. In the next round of contract negotiations between the Big Three employers and their employees represented by the United Auto Workers (UAW) in the United States and the Canadian Auto Workers (CAW) in Canada, which is expected later in 1996, the two major issues are expected to be outsourcing and retirement benefits. The outcome of these negotiations will have major implications for future competitiveness.

There are major employment opportunities in this sector to replace significant numbers of retiring workers (production line workers in vehicle assembly plants and skilled trades in parts manufacturers) over the next decade. Initiatives will be needed to attract youth to, and prepare them for, positions in these industries.

Sustainable Development

The automotive industry faces growing pressures on a number of environmental fronts: air pollution, traffic congestion, cost of transportation infrastructure, fuel efficiency and scrappage/landfill practices. In response to these pressures, vehicles have generally become smaller, lighter and substantially more fuel efficient, and are incorporating more recyclable materials. Canada is home to companies having niche technologies that can be employed in this area.

In view of the structure of the North American automotive industry, Canada has adopted the approach of harmonizing safety and emission standards with the U.S. to the greatest extent possible. On October 23, 1995, the Canadian Council of Ministers of the Environment (CCME) recognized the benefits of harmonization and recommended the adoption of a national approach for setting vehicle emission and related fuel standards so that Canadians can benefit from the best available technology.

The vehicle and fuel industries in Canada agree on the long-term need to provide appropriate fuels to allow Canadian consumers to benefit from leading vehicle technology and resulting improvement to the environment. However, there is some disagreement on the actual fuel formulation required, and consequently these industries must work together to determine appropriate parameters for fuels in Canada to ensure compatibility with vehicle emission technology.

There is also some movement toward harmonization on a global basis within the United Nations' Economic Commission for Europe Working Party 29 (UN WP29) and the Transatlantic Business Dialogue. Canada must participate in these fora and contribute to the dialogue.

Regulatory Reform

In November 1994, the government announced in its policy document *Building a More Innovative Economy* (Supply and Services Canada, 1994) that sectoral regulatory reviews would be conducted in the automotive and forestry sectors as well as in four others. Since then, the Business Impact Test (BIT), developed by Industry Canada and Treasury Board with the Canadian Manufacturers' Association (CMA), has been used with the automotive sector in a consensus-building exercise to obtain agreement on key regulatory problems. The key issues arising from it are tax harmonization, technical standards and the Workplace Hazardous Materials Information System (WHMIS).

Firstly, the lack of harmonization of federal and provincial sales tax regulation and the cost of carrying Goods and Services Tax costs on exports introduce costs that, if addressed, would lead to considerable savings. Secondly, the automotive sector has given high priority to improving the dispute resolution process used in dealing with technical safety issues related to motor vehicles. Lastly, improving the WHMIS is being given high priority by the automotive sector. WHMIS legislation interacts with or parallels a number of other pieces of federal legislation such as the *Canadian Environmental Protection Act* and provincial legislation. The industry finds that the various WHMIS information requirements do not mesh effectively with others, creating unnecessary costs.

Micro-economic Climate

The Canadian automotive sector is currently performing strongly. Over the past few product cycles, the assembly industry has benefited from some very strong product mandates. However, competitive demands, combined with the streamlining of the product design process, are leading to shorter product cycles. Canadian assembly plants have to compete continuously with their U.S. counterparts for production mandates. In this context, it is crucial for the Canadian operations to remain competitive in order to continually win new and renewed mandates, since the associated investment is derived from foreign sources with no inherent commitment to Canada. It is therefore important for the micro-economic climate to be a positive inducement to such investment.

The same is true for parts manufacturers, whose investments are based on comparative economies in North America. Canada is competitive in most cases, but investment incentives in many American states can influence an investment decision. These also apply in the assembly sector and have been a significant factor in the recent investments made by BMW and Mercedes-Benz.

The Bottom Line

The Canadian automotive sector is currently in a reasonable position, but there are a number of critical issues that could adversely affect its future competitive position. These issues must not be looked at in isolation but rather as part of Canada's overall automotive policy. Consequently, the government plans to begin a review of Canada's automotive strategic policy framework within the next year, in full consultation with all stakeholders, with a view to maintaining the competitiveness of the automotive sector in Canada.

2 KEY POINTS ABOUT THIS INDUSTRY

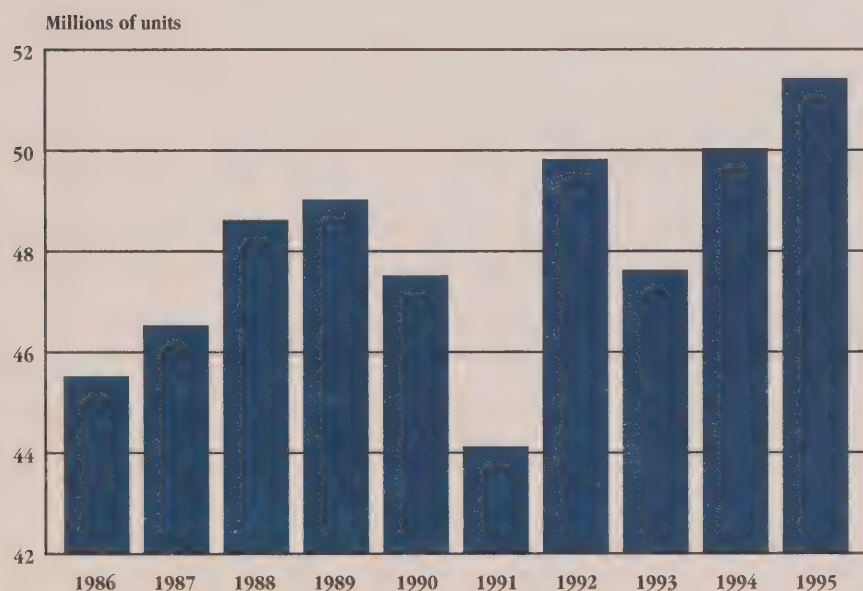
The automotive industry is defined in Statistics Canada's Standard Industrial Classification (SIC) in terms of code 323, Motor Vehicle Industry, and code 325, Motor Vehicle Parts and Accessories Industries.

2.1 Global Context

The Canadian automotive sector operates in a global context concentrated mainly around three regional markets: North America, Europe and Japan. These currently account for the bulk of product development, world production (84 percent) and consumption (77 percent). However, important markets and significant production bases are emerging in newly industrialized areas in eastern Europe, South America and the rest of Asia. Fifty-one million units were produced worldwide in 1995 (Figure 1), with the top five companies accounting for about 51 percent.

**NA, Europe and Japan
produce 80% of
world's automobiles**

Figure 1. World Production of Light Vehicles



Source: *Ward's Automotive Yearbook*, annual.

**Canada places sixth among
the top world producers**

Ranked according to 1995 vehicle production, the top six countries are the United States, Japan, Germany, France, the Republic of Korea and Canada. As a result of its increased production, the Republic of Korea surpassed Canada in 1994 to achieve the fifth place in this ranking. Canada does not have a national assembler, but its position is influenced by a competitive micro-economic climate, proximity to Detroit and long-standing, unfettered access to the U.S. market through the 1965 Canada–U.S. Automotive Products Agreement (Auto Pact). This access was subsequently reinforced by the Canada–U.S. Free Trade Agreement (FTA), which was implemented in 1989, and the North American Free Trade Agreement (NAFTA), which was implemented in 1994 among Canada, the United States and Mexico. Increased global competition and changing world conditions, with increasing production capacity in countries such as the Republic of Korea and Spain, have and will continue to affect this ranking in the future.

**A few large players
dominate global scene**

In both vehicle assembly and components production, the global sector is dominated by a small number of large players. Technological demands and increasing competitive pressures are fuelling global integration. The industry seeks out both product and process technology worldwide, and basic technologies are rapidly diffused among the major manufacturers, further contributing to the rationalization of both assemblers and suppliers. There is growing momentum for world car projects that involve a common platform, with exterior and interior styling and other modifications to suit local preferences, and that incorporate the best available practices and technologies in design, parts selection, assembly and sales.

Although the industry is becoming increasingly globalized, interregional automotive trade remains very low: vehicle trade accounts for only 11 percent of total production, while parts trade accounts for merely 6 percent of total parts output. The current parts trade between North America and Japan consists mainly of components flowing to relatively new Asian-owned plants in North America. Historically, sustaining market share in each region has required vehicle producers to establish a production base in each prime market area. As a result, while all major vehicle manufacturers are internationalizing their product development, they are at the same time localizing production in all major market areas, thus limiting world trade in vehicles. For instance, while Japanese producers enjoyed some initial success in exporting to North America and Europe, trade frictions, production costs and marketing needs led to the transfer of more production to these regions. North American producers have long had a production base in Europe, and European assemblers are now starting to establish in North America (e.g. BMW in South Carolina and Mercedes-Benz in Alabama). Volvo has been established in Canada since the 1960s. To meet the needs of vehicle assemblers, major parts producers are accompanying them across the globe and setting up production facilities close to them.

Globalization of automotive production requires free movement of technology, capital and key components. To facilitate this, great efforts have been made worldwide to create a freer trade environment. While the Canadian and U.S. markets are open, some countries still retain high tariffs and other barriers in order to foster their own automotive industry. Lower tariffs and elimination of non-tariff barriers in emerging markets such as Asia and South America will create some opportunities for exports.

**Three major regions trade
only 11% autos, 6% parts**

**Globalization demands
freer trade**

2.2 North American Context

In North America (Canada, U.S. and Mexico), more than 90 automotive assembly plants produced approximately 15 million light vehicles in 1995. Fourteen plants located in Canada account for 16 percent of North American output. North America remains the world's largest market, with sales of approximately 16.4 million units in 1995, compared with 13.7 million in Europe and 6.9 million in Japan.

**1965 Auto Pact integrated
U.S. and Canadian
auto industries**

The 1965 Auto Pact, by creating a conditional duty-free manufacturing environment, led to a fully integrated Canada–U.S. automotive sector, with efficient world-scale plants. Except for Honda and Toyota, all major automakers in Canada operate under the Auto Pact. The integrated production process created major reciprocal automotive trade between the two countries. Consequently, there is no close correlation between Canadian assembly capacity and auto parts produced in Canada.

**Mexico joined NAFTA
in 1989: complete
North American free trade
coming in 2003**

Beginning in 1989, the FTA reinforced the integration of the automotive sector. The inclusion of Mexico in the North American trading bloc under the NAFTA is expected to lead to further integration of production among all three countries, as companies select production sites and scale based on business factors rather than the need to locate behind tariff or other trade barriers. All auto trade between Canada and the U.S., and between Canada and Mexico, that meets NAFTA rules of origin will be duty-free when the FTA and NAFTA tariff reductions are fully in place in 1998 and 2003, respectively (see Annex C for a listing of North American tariff rates).

2.3 Canadian Automotive Sector Snapshot

The Canadian automotive manufacturing sector consists of two major industries: motor vehicle assembly and components production. The sector produces a wide range of products: assembly includes passenger cars, light-duty trucks (vans, minivans, sport/utility vehicles and pickup trucks); parts production includes engines and major drivetrain components, steering and suspension parts, wheel and brake parts, stampings, seats, interior and exterior trim, and electrical components.

The Canadian automotive sector includes 14 assembly plants and 554 automotive parts manufacturers. The assemblers are represented by two industry organizations: the Motor Vehicle Manufacturers' Association (MVMA), representing the Big Three (Chrysler Canada Ltd., Ford Motor Company of Canada Ltd. and General Motors of Canada Ltd.) and Volvo Canada Ltd.; and the Japan Automobile Manufacturers' Association of Canada (JAMA), representing Honda Canada Manufacturing, Toyota Motor Manufacturing Canada Inc. and Suzuki Motor Corporation. There are two principal industry associations in the automotive parts industry: the Automotive Parts Manufacturers' Association (APMA), representing suppliers of original equipment parts; and the Automotive Industries Association (AIA), representing manufacturers of aftermarket parts and accessories and garage and repair equipment.

Except for Honda and Toyota, the production work force in the assembly industry is unionized. Approximately 45 percent of the work force in the independent parts industry is unionized, while 100 percent of the production work force in affiliated parts facilities is unionized. The National Automobile, Aerospace, Transportation and General Workers Union of Canada, known as the Canadian Auto Workers (CAW), is the largest single union in the automotive sector, representing unionized workers in both the assembly and parts industries.

Canadian automotive sector produces wide range of products

Assembly labour force is highly unionized

**Auto sector has Canada's
highest foreign direct
investment**

The working relationship and consultative process among stakeholders in the automotive sector involves the full participation of assemblers, parts producers and governments at both the federal and provincial levels. The Automotive Advisory Committee (AAC), formed in 1989, has been the main consultative channel for the identification and analysis of sectoral issues and the joint implementation of action to enhance the sector's competitiveness.

The automotive sector has the highest foreign direct investment concentration in the Canadian economy. At the end of 1994, the total productive stock of foreign direct investment in Canada's automotive sector stood at \$17 billion. Of this total, 85.6 percent was from the United States (amounting to \$14.6 billion in both assembly and parts industries), 7.3 percent from Europe (\$1.3 billion mainly concentrated in the parts industry), and 5.8 percent from Japan (\$1 billion predominantly focussed on assembly).

The automotive sector is a key component of the Canadian economy, accounting for a substantial percentage of employment and industrial output (Table 1).

Table 1. Automotive Sector Key Statistics

	Employment	Shipments	Exports	Imports
1995 level	138 755	\$71 billion	\$62.5 billion	\$53.8 billion
Change 1994/1995 (%)	3.0	14.5	7.0	3.2
Share of total manufacturing (%)	8.3	18.5		
Share of merchandise trade (%)			24	22
Source: Statistics Canada, Industrial Monitor Database, and Catalogue No. 65-001; Industry Canada, <i>Automotive Quarterly Circular</i> .				

Canada's automotive shipments (according to data collected under SIC 323 and 325) in 1995 were at a record level of \$71 billion. The 1995 annualized average direct manufacturing employment was 138 755. Total employment related to the sector, including retail and aftermarket parts manufacturers and distributors was 501 970, up by 2.7 percent from the 1994 level of 488 854.

Automotive trade accounts for about 23 percent of total Canadian merchandise trade. The 1995 trade balance for vehicles was positive at \$28.9 billion, while the balance for parts was negative at \$20.2 billion. Annual Canada–U.S. trade in parts, subassemblies and vehicles is currently worth more than \$100 billion.

The automotive sector contributes over 11.5 percent to Canada's manufacturing gross domestic product (GDP) and 2.2 percent to total GDP. As measured by value-added among industries designated at the SIC three-digit level, automotive parts manufacturing in 1995 was Canada's largest manufacturing industry, and motor vehicle assembly was the fifth largest. The sector plays an even greater role in Ontario's economy, accounting for approximately 20 percent of total provincial manufacturing GDP in 1994.

The automotive sector's contribution to the economy is much greater when its forward and backward linkages to the other sectors are taken into account. According to the Canadian Manufacturers' Association, the multiplier associated with the automotive sector is more than three; that is, \$1 of automotive output will generate over \$3 in the total economy.

Canada's 1995 auto shipments reach all-time high of \$71B

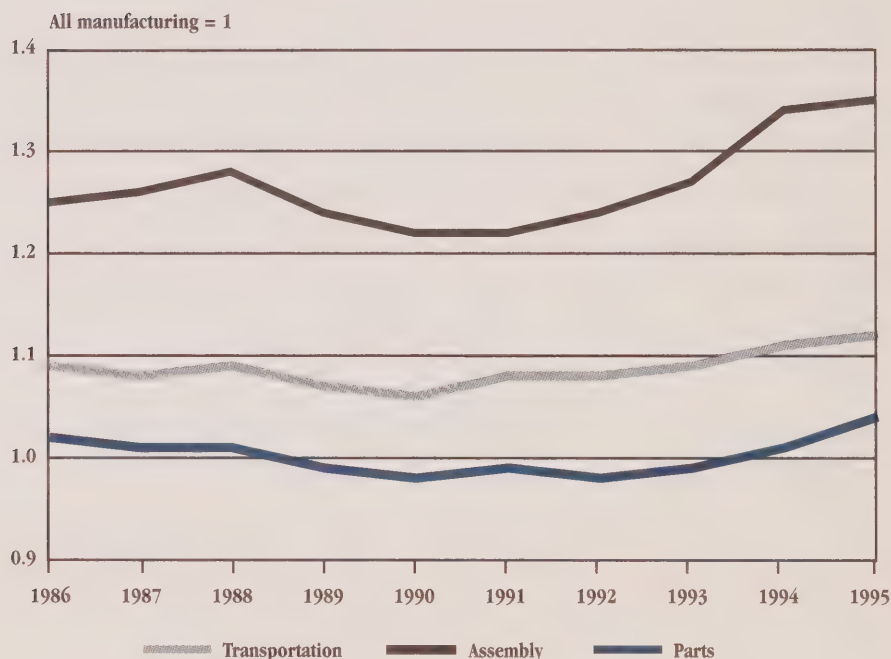
Automotive sector accounts for 23% of Canadian merchandise trade

Auto industry is Canada's largest contributor to manufacturing GDP at 11.5%

\$1 in automotive output generates \$3 in total economy

This sector contributes significantly, both directly and indirectly, to the employment level in Canada. For example, an increase in assembly employment of 17.4 persons, arising from a \$10-million demand shock in the vehicle market, results in an additional 37.7 jobs throughout the economy. Furthermore, the automotive sector provides high-paying manufacturing jobs. Compared with manufacturing average weekly earnings, the assembly industry average wage rate was 35 percent higher for 1995, while that for the parts industry was 4 percent higher (Figure 2).

Figure 2. Average Weekly Earnings of Selected Industries, Indexed by all Manufacturing Sectors



Source: Statistics Canada, Industrial Monitor Database, February 1996.

2.4 Assembly Industry

The Canadian light vehicle industry assembles passenger cars, light-duty trucks and vans with a gross vehicle weight under 4540 kilograms, and comprises 12 plants in Ontario, one in Quebec and one in Nova Scotia. Plant concentration in southern Ontario is reinforced by recent demands for concurrent design and just-in-time production (see Annex D for a list of assembly plants).

The assembly plants in Canada are owned by Chrysler, Ford, General Motors, Honda, Toyota, Suzuki and Volvo. Foreign ownership, and resulting structural factors, limit Canadian activity to vehicle assembly and sales. Corporate planning, research, design and engineering activities are largely carried out at corporate headquarters in other countries.

In 1995, Canada produced 2.4 million light vehicles, 16 percent of North American production, and 17 percent of joint Canada–U.S. production, an increase of one percentage point over the level a year earlier. This is expected to continue as a result of expansions coming on line in 1998. Currently, the Big Three's share of vehicle production in Canada (including production of CAMI Automotive Inc., a joint venture between General Motors and Suzuki) is 91.4 percent, and the share of the Asian assemblers (Honda and Toyota) is 8.3 percent. European firms account for the remaining 0.3 percent.

Along with the steady growth in Canadian vehicle production, there has been corresponding progress in the financial results for all the assemblers. Financial statements for the Japanese-owned assemblers in Canada are not available. Those of the Big Three show strong financial performance over the past few years. This performance is not so much a reflection of the Canadian market

**Ontario has 12 auto plants,
Quebec and Nova Scotia
one each**

**Canada accounts for 16% of
NA light vehicle production**

**Exports fuel strong
financial performance**

**Canada exported over
90% of 1995 shipments**

**Canada has world's highest
assembly to sales ratio**

for vehicles as it is a reflection of exports, mainly to the United States. Chrysler Canada's net earnings were \$83 million in 1995, compared with a net loss of \$48.6 million in 1992. Its net earnings as a share of sales increased from -0.5 percent to 1.3 percent over the same period. Ford Canada's performance improved in 1995 to net earnings of \$213 million from a net loss of \$364 million in 1992. Over this period, its net earnings as a share of sales improved from -2.5 percent to 1 percent. GM Canada experienced a record level of revenue of \$30.8 billion and a net profit of \$1.39 billion in 1995, compared with a net loss of \$72 million in 1992. Its net profit as a share of sales increased from -0.4 percent to 4.5 percent over the same period.

Canada has had a trade surplus in motor vehicles for the past 31 years. More impressively, this surplus position has improved drastically in recent years. In 1995, more than 90 percent of Canada's vehicle shipments were exported. The U.S. remains the largest market, accounting for 98 percent of all Canadian vehicle exports in 1995. The motor vehicle trade surplus with the U.S. reflects the integrated nature of the North American automotive sector.

A competitive investment climate and a conducive trade regime (under the Auto Pact, the FTA and the NAFTA) have encouraged growth in assembly. As a result, the number of light vehicles assembled is about twice as large as the number sold. The Canadian motor vehicle industry currently has the highest assembly to sales ratio of any major vehicle-producing nation in the world (Table 2). The recently weak Canadian light vehicle sales market has contributed to the increase of this ratio. This ratio is expected to decrease if the Canadian market returns to its trend level. North American and European firms have improved their ratios over the past two years. The ratio for Japanese firms has declined steadily because of less buoyant domestic sales and the transfer of significant volumes of vehicle production to North America and Europe, partly as a result of the increased cost structure stemming from the strengthening Japanese yen.

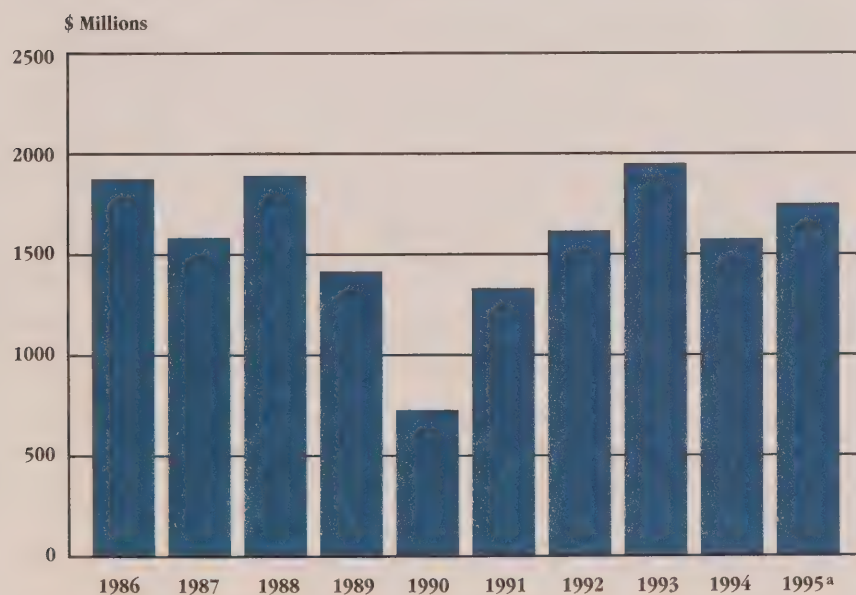
Table 2. Ratios of Vehicle Assembly to Sales

	North America	Europe	Japan	Canada
1970	0.9:1	1.3:1	1.4:1	1.5:1
1980	0.7:1	1.1:1	2.2:1	1.1:1
1990	0.8:1	1.0:1	1.7:1	1.5:1
1992	0.8:1	1.1:1	1.8:1	1.6:1
1993	0.9:1	1.1:1	1.7:1	1.9:1
1994	1:1	1.1:1	1.6:1	1.9:1
1995	1.1:1	1.1:1	1.5:1	2.1:1

Source: *Ward's Automotive Yearbook*, annual.

Capital investment in the Canadian assembly industry has significantly increased since the mid-1980s (Figure 3). A large majority of the investment has been made by the Big Three; however, significant expansions have been announced recently by Honda and Toyota. Investments in this sector have largely focussed on expanding production capacity, retooling to introduce new product mandates or modernizing existing facilities. Over the past five years, total investment in the Canadian assembly industry has been more than \$8 billion.

**Capital investment
increasing toward
\$2B annually**

Figure 3. New Capital Expenditures, Assembly Industry


^a Preliminary actual

Source: Statistics Canada, Catalogue Nos. 61-214 and 61-205.

All Canadian assembly plants have state-of-the-art automotive technology and use robotic welding systems, automated guided vehicle systems, custom-designed materials handling systems, and integrated machinery processes. There is significant diffusion to the machinery manufacturing sector and other sectors.

Reflecting the structure of the industry, which developed within a trade policy context stressing domestic production, assemblers in Canada undertake limited research and development (R&D) activities. The lion's share is carried out by the Big Three. In 1995, Statistics Canada reported \$44 million in such expenditures in Canada, although manufacturers believe that this figure significantly understates R&D actually taking place, as it excludes significant design and engineering expenditures. For the most part, vehicle manufacturers carry out their research, design and engineering activities at headquarters in Detroit and Tokyo or at selected satellite centres in major markets. Once the technology is developed, it is quickly diffused into the Canadian assembly plants and products.

**Canadian assembler R&D
is increasing**

Canadian R&D by assemblers is gradually increasing. GM undertakes R&D in niche manufacturing and product technology, such as alternative-fuel vehicle technologies at its Oshawa, Ontario, facility and has installed a cold-weather testing centre at Kapuskasing, Ontario. Chrysler has recently opened a facility, in a strategic alliance with the University of Windsor, to conduct research in the areas of road simulation, advanced engine design and alternative fuels. For their development of alternative-fuel vehicles, Chrysler Canada received a 1993 Natural Resources Canada/CANMET Lab Technology Transfer Award. In 1993, Ford established an aluminum casting technology centre and a Chair at the University of Windsor, which is to become Ford's world centre for aluminum research.

Automotive assembly employment was 53 162 in 1995, remaining relatively steady since the mid-1980s, except for a 1988–89 growth of 5.1 percent, attributable to significant productivity gains.

Growth in Canadian automotive assembly employment compared favourably with that of all manufacturing. While all manufacturing employment decreased from 16 percent to 12 percent of the nation's total employment from 1985 to 1995, the auto assemblers' share of manufacturing jobs rose from 2.7 percent to 3.1 percent over the same period. With demand surging for some of the products made in Canada, new employment is being created, as evidenced by the third shift recently added at Chrysler's Windsor, Ontario, minivan plant.

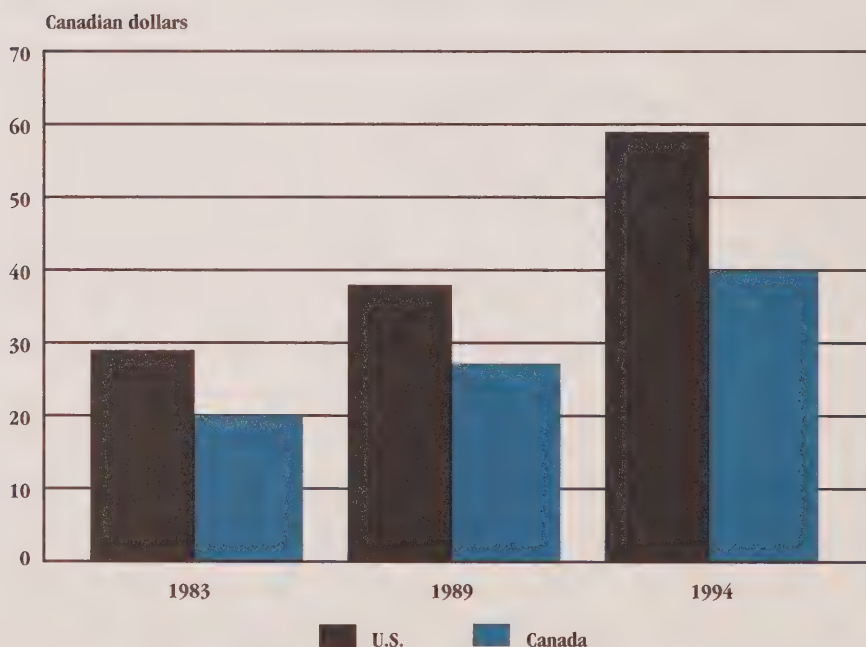
Based upon research conducted in 1989–90 by the U.S. firm of Booz, Allen & Hamilton Inc., direct labour and benefits amount to 62 percent of assembly (i.e. the act of assembling the vehicle) cost, which in turn accounts for 11 percent of the factory cost of a finished vehicle. A review of assembly costs for the Big Three in Canada and the U.S. shows that, with the exception of labour, they are similar.

Auto assembly increases its share of manufacturing employment

**Canadian labour cost
advantage remains
substantial**

Since labour is such a large part of assembly, its cost can determine competitive edge. Canada's labour cost advantage is considerable: 32 percent less than U.S. costs (using the average annual prevailing exchange rate) in 1994 (Figure 4). Base pay accounted for 2.4 percentage points of the advantage and benefits, chief among them the lower cost of health care to manufacturers in Canada, accounted for 29.6 points. Even employing a purchasing power parity (PPP) exchange rate of 82 cents U.S. per Canadian dollar, the 1994 labour cost advantage would still be substantial at 24 percent. Asian-owned plants in Canada have a smaller labour cost advantage over their operations in the United States. This is mainly due to lower social benefit costs associated with a younger work force.

Figure 4. Hourly Labour Cost in the Assembly Industry



Source: Harbour and Associates, Inc., *The Harbour Report*, 1995;
Industry Canada estimates based on data provided by companies.

The Big Three's Canadian labour costs have increased as a result of negotiations by the CAW for higher wage increases to reduce the Canada–U.S. wage gap, while in the United States the United Auto Workers (UAW) has worked to reinforce job security for its members. Company “no closure” agreements with the UAW, combined with increasing Canadian labour costs, may affect future capacity decisions. However, given the lower employer contribution rate to similar benefit packages in Canada relative to the United States, overall assembly labour costs in Canada remain lower and should continue to make production in Canada relatively attractive.

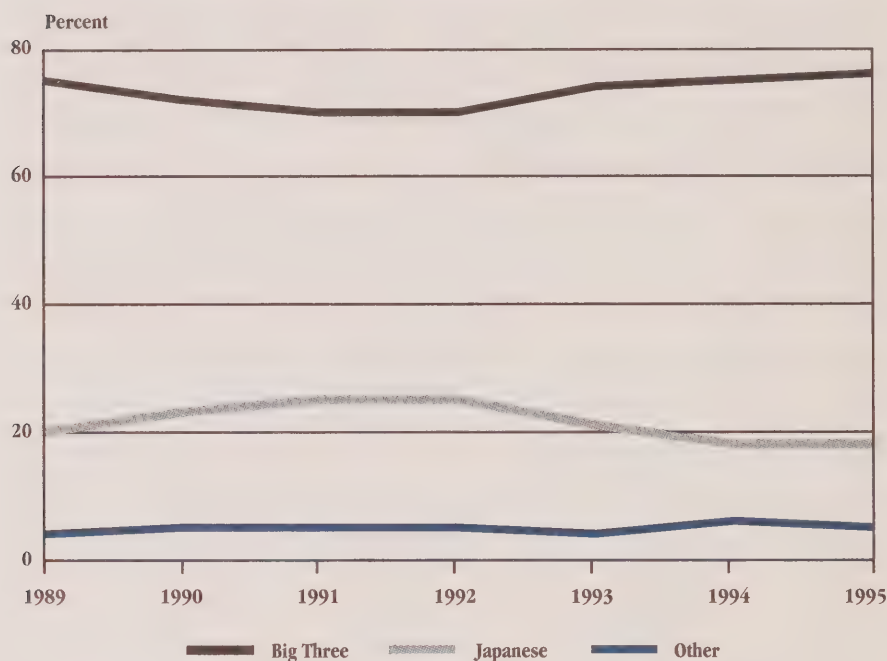
A standard assembly productivity measure is workers per vehicle (WPV), defined as total plant workers divided by daily output. While both U.S. and Canadian assembly facilities have improved labour productivity significantly (as measured by WPV), Canadian facilities in 1994 ranked higher than those in the United States. Assembly labour productivity in Canada experienced a 5-percent increase from 1993 to 1994, while that in the U.S. gained 3.4 percent over the same period. According to Harbour and Associates, Inc. (*The Harbour Report*, 1995), of all the Canadian assembly facilities, Asian-owned plants have the highest productivity at 2.6 WPV, followed by Ford at 3.2 WPV, and Chrysler and General Motors both at 3.3 WPV.

Total Canadian light vehicle sales were 1 119 100 units in 1995, with North American-produced vehicles accounting for 88 percent and imports 12 percent. The share of sales accounted for by imported vehicles has been decreasing steadily from 25 percent in 1990, largely because of the combination of two factors. One was a decrease in imports from Japan as the Japanese vehicle manufacturers expanded their production in North America. The other was a loss in market share for Japanese manufacturers.

**Canadian labour
productivity higher
than U.S.'s**

The Canadian light vehicle market is dominated by the Big Three, with a 76-percent share in 1995, followed by the Japanese assemblers with an 18-percent share (Figure 5). The Europeans supplied most of the balance.

Figure 5. Canadian Automotive Market Shares of Light Vehicle Sales



Source: Motor Vehicle Manufacturers' Association; Ward's Automotive Reports; Association of International Automobile Manufacturers of Canada.

**Canadian plants win
awards, produce
quality vehicles**

Global competition, along with technological developments, led to a dramatic improvement in North American production quality over the past decade. Recently, Canadian plants have moved ahead of their U.S. counterparts. Using the widely accepted J. D. Power and Associates' Initial Quality Survey measure (problems per 100 vehicles or PPV), a comparison of U.S. and Canadian plants producing the same 1995 vehicle reveals that, on average, Canadian plants produce higher-quality output. In the recently announced 1996 North

American Plant Quality Awards, the Toyota plant at Cambridge, Ontario, and the Honda plant at Alliston, Ontario, received the Gold and Silver awards, respectively. Volvo's Halifax, Nova Scotia, facility ties with Toyota's Cambridge facility in PPV but, because of a small sample size, was not considered for an award. Also, Ford's St. Thomas, Ontario, plant tied with NUMMI of Fremont, California, for the 1994 Silver award.

2.5 Components Industry

The automotive parts industry includes affiliated parts producers owned by vehicle assemblers and independent producers consisting of both subsidiaries of foreign-owned multinational enterprises and Canadian-owned enterprises. The industry produces a wide range of vehicle subsystems and components for assemblers, sometimes referred to as the original equipment (OE) manufacturers as well as replacement parts and accessories for the aftermarket.

The parts industry is very diverse, both in its product array and its ownership structures. Canadian- and U.S.-controlled manufacturers, including assemblers' affiliated operations, produce over 90 percent of domestic parts output.

Canadian-controlled firms account for about 50 percent of shipments and 60 percent of employment. Domestic ownership is highest in the independent stamping, electrical equipment and plastic parts subsectors, where Canadian companies produce almost two thirds of subsector output.

North American assemblers, especially the Big Three, are the major customers for the Canadian parts producers. In 1995, they purchased \$16.2 billion worth of the approximately \$21-billion Canadian parts production. Most of the producers supply all North American assemblers, with 93 percent of the firms supplying the Big Three.

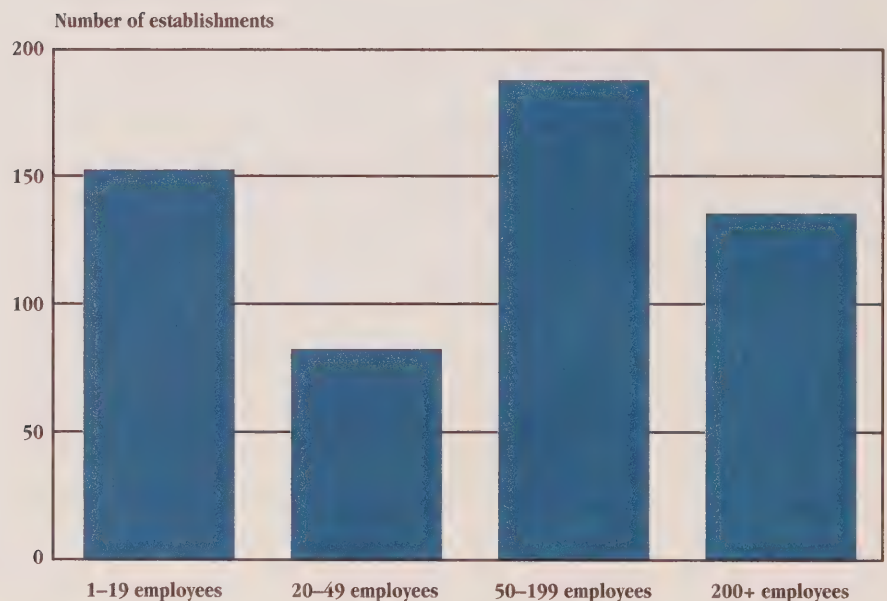
**Canadian auto parts
industry depends heavily
on Big Three**

Auto parts industry firms have doubled in 10 years

The auto parts industry has grown significantly over the past decade, when the number of establishments doubled. In 1993, Statistics Canada reported 554 auto parts establishments under SIC 325. Industry members, however, believe that the supplier universe is much broader, since many parts producers are classified under other SICs. Ontario is home to 73 percent of these firms, reflecting its proximity to North America's geographic core of automotive manufacturing activity, Quebec has 14 percent, and British Columbia has 6 percent.

Small facilities dominate the industry landscape, but do not dominate the major portion of employment and shipments. Some 43 percent of establishments have fewer than 50 employees, and 77 percent of establishments have fewer than 200 employees (Figure 6). Only 23 percent of firms employ more than 200, but they account for 79 percent of shipments and 70 percent of employment.

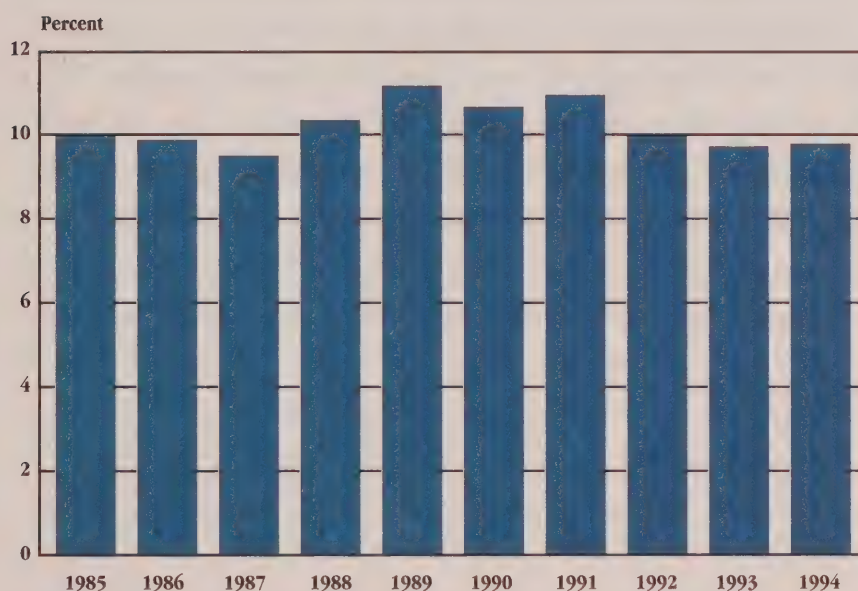
Figure 6. Distribution of Automotive Parts Establishments by Employment, 1993



Source: Statistics Canada Special Run, 1995.

The auto parts industry accounted for 1.4 percent of total Canadian GDP in 1995, with estimated annual shipments of about \$21 billion. This figure includes the parts manufacturers that produce for both the OE manufacturers and aftermarkets, and aftermarket production is estimated to be 7 percent of total parts shipments. The parts industry has experienced strong growth, with shipments increasing by over 400 percent from 1980 to 1995. Canada's share of combined Canadian and U.S. automotive parts output has remained steady over the past decade at around 10 percent (Figure 7).

Figure 7. Canadian Share of Canada-U.S. Parts Shipments



Source: Industry Canada, *Statistical Review of the Canadian Automotive Industry, 1995*; U.S. Department of Commerce, *Industry Outlook, 1994*.

This strong growth in parts output can be attributed to several factors: a strong quality record; favourable exchange rates; investments in leading-edge technology; the market of the vehicles for which parts are supplied; and the emergence of some Canadian-based multinational enterprises as major world players such as Magna International, the Woodbridge Group, Linamar, A. G. Simpson and the ABC Group. However, the most important factor is the increased competitiveness of the industry, which has resulted in import substitution.

**Canadian auto parts
shipments have increased
400% in 15 years**

**Increased competitiveness
gives Canadian parts
producers more business**

**More outsourcing increases
role for independent
producers**

Because of Canadian assembly expansion, Canada's automotive parts consumption increased by 366 percent from 1980 to 1994, while for the same period, imports increased by 320 percent. Consequently, the ratio of parts imports to consumption dropped from 97 percent to 87 percent. This drop suggests that local parts producers have gained more of the business of assemblers in Canada. This gain is also evidenced by the decrease in Canada's ratio of parts exports to shipments from 95 percent to 76 percent between 1980 and 1994.

Total North American parts consumption is estimated at \$160–165 billion, of which imports, mainly from Japan, account for 10 percent. The steady appreciation of the Japanese yen and growing Asian-owned assembly capacity in North America have led to increased Japanese investment in the parts industry in North America and increased purchases from Canadian- and American-based suppliers. For the period 1993–94, Asian assemblers increased the amount of their sourcing in Canada by C\$200 million and in the U.S. by US\$4 billion. In 1994, they purchased C\$1.4 billion worth of inputs from Canada and US\$19 billion worth of inputs from the United States.

In recent years, shipments and employment have shifted significantly from affiliated to independent producers. Between 1985 and 1993, the affiliated parts producers' share of shipments decreased from 46 percent to 33 percent, and their share of employment dropped from 25 percent to 20 percent. This drop is mainly due to increased outsourcing by the Big Three and local sourcing by Asian assemblers.

Technological advances, stiffening competition and new legislation with increased demand for additional safety and environmental features have stimulated the development of more complex automotive components. With components accounting for 65–75 percent of the value of a vehicle today, vehicle manufacturers are putting heavy cost-cutting pressure on their suppliers.

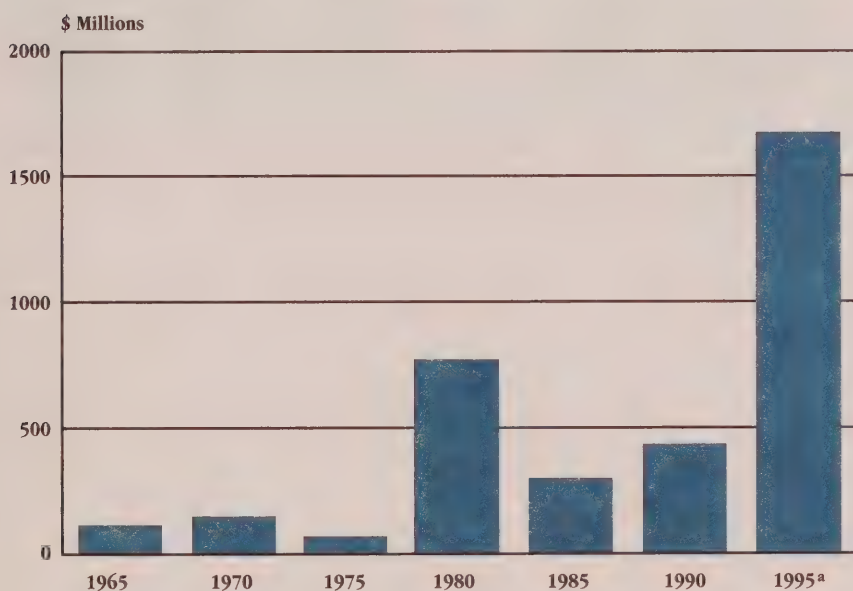
The supply chain has been seriously challenged and consolidated. These structural changes are expected to continue, with significant impact on parts producers. Parts producers can be ranked as Tier One companies, comprising system developers and integrators, and Tier Two companies, comprising individual component and subassembly producers. Opportunities for new product sourcing will mainly benefit the stronger Tier One companies. If, as most observers predict, production continues to shift from in-house (e.g. GM, with 70 percent affiliated parts production) to independent Tier One companies, then Canadian companies, which are mainly Tier Two companies, will face increased challenges as they work to win over new customers and retain existing business (see Annex B for a discussion of restructuring in the components industry).

Investment in the Canadian automotive parts industry has seen a dramatic increase, with 1995 investment more than double the level of 1985 (Figure 8). Significant expansion and renewal has taken place in affiliated facilities such as GM's transmission plant in Windsor, Ontario, and Ford's engine plants in the same city. Major investments have also been made by Canadian- and U.S.-owned independent parts manufacturers as well as by Japanese and European firms.

Structural changes in supply chain will challenge Canadian firms

1995 investment in Canadian auto parts industry are at record high

Figure 8. New Capital Expenditures, Motor Vehicle Parts Industry



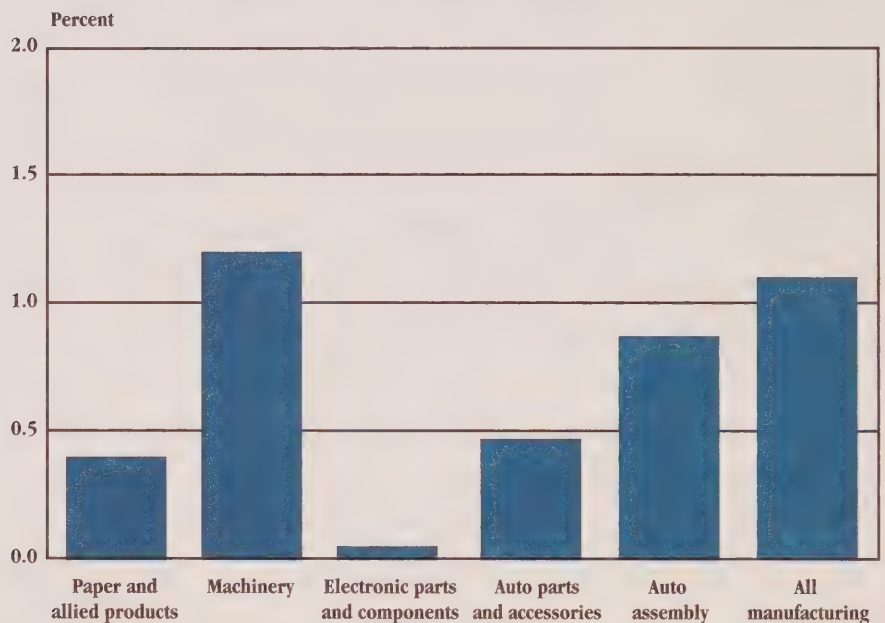
^a Preliminary actual.

Source: Statistics Canada, Catalogue Nos. 61-214 and 61-205.

Substantial parts investment is expected to continue. According to Statistics Canada (Catalogue Nos. 61-214 and 61-205), capital expenditure in the parts sector for 1995 stood at over \$1.67 billion, of which about 95 percent was for upgrading machinery and equipment to ensure continued competitiveness.

While Canadian plants are modern and highly productive, expenditure on R&D is low both in absolute terms and in comparison with other industries (Figure 9).

**Figure 9. R&D Expenditure as a Share of GDP,
Selected Industries, 1994**



Source: Statistics Canada, Service Bulletin, Science Statistics, 1995;
Statistics Canada Special Run, 1996.

From a high point of \$54 million in 1987, both R&D expenditures and the number of performers have been decreasing. In 1995, only 26 companies performed R&D, spending a total of \$36 million. Two thirds of the R&D performers were Canadian-owned, independent parts companies, while more than 85 percent of the expenditures were undertaken by foreign-owned companies. The R&D expenditures by Canadian independent parts companies tend to focus on niche product development and on advanced manufacturing processes. In addition, there are at least five research institutes performing related work, mainly on alternative-fuel technology.

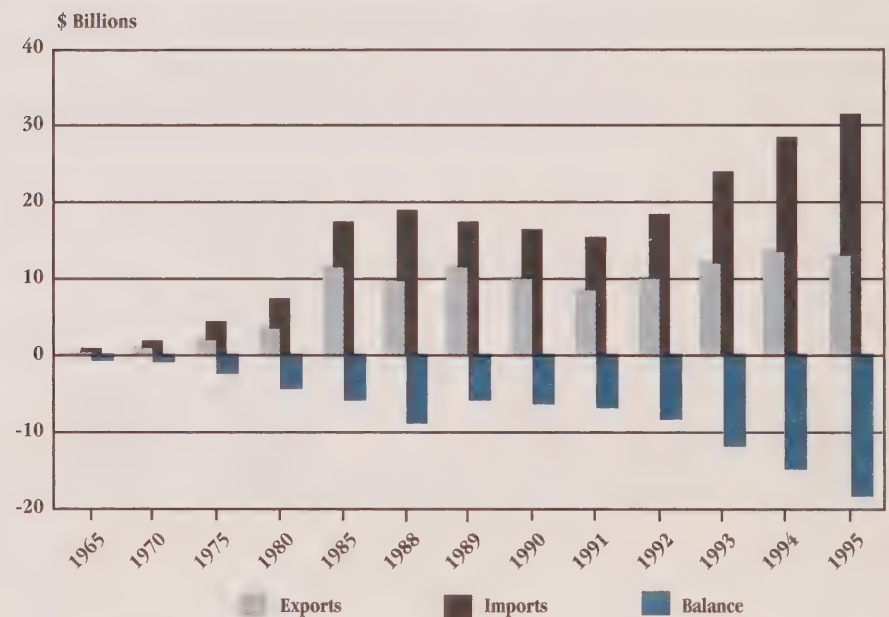
Worldwide, countries tend to produce parts roughly to match the needs of domestic assembly. Although increasingly components are being sourced globally, shipping costs and delivery time lead global suppliers to locate parts production close to assembly plants. Thus, parts production currently remains highly regionalized. Technology is primarily diffused through branch plants or licensing.

The ratio of component production to consumption in the three major regions of world automotive production is nearly 1:1. This ratio in Canada's components industry is much lower, averaging 0.6:1. This is not due to a lower level of domestic parts production *per se*, but rather to Canada's faster growth in assembly activity. Canada's share of North American parts production (11 percent) in fact exceeds its share of light vehicle sales (7 percent).

**Canada's auto parts
companies diversify
markets**

Canada's high assembly output has produced a chronic trade deficit in parts, amounting to \$20.4 billion in 1995 (Figure 10). The United States holds a dominant position in the Canadian parts trade, accounting for \$18.1 billion of the 1995 deficit. However, as the automotive sector has developed and evolved in other parts of the world, Canada's automotive parts trade with other countries has increased significantly. Consequently, parts imports from the U.S., as a percentage of total Canadian auto parts imports, have decreased from 95 percent in 1985 to about 89 percent in 1995. Over the same period, parts exports to the U.S., as a percentage of total Canadian parts exports, have also decreased from 97 percent to 88 percent.

Figure 10. Canada—U.S. Trade in Automotive Parts



Source: Statistics Canada, Catalogue Nos. 65-001P, annual, and 11-001E (1965–1989)

Labour productivity increased 14% in a decade

Canadian automotive parts industry employment in 1995 stood at 85 593, twice its 1980 level, whereas parts shipments increased fourfold in the same period. Labour productivity, as measured by the amount of value-added per production hour worked, shows the efficiency with which labour input is converted into increased output. Increased automation and higher-value-added subassembly and systems development improved the labour productivity in the automotive parts industry by 14 percent from 1983 to 1992.

3 CHANGING CONDITIONS AND INDUSTRY RESPONSE

3.1 Trade

With the practice of regionalized production (i.e. producing in each prime market area for the local market), trade among the main regional blocs (i.e. North America, Europe and Japan) is limited. However, with increased investment from Japan and Europe and their expanded production in North America, the trend of exports from North America is increasing. Increased North American exports can be attributed to all assemblers.

There exist opportunities for parts producers, as OE manufacturers “produce locally and source globally.” While some parts are sourced on a global basis, vehicle manufacturers generally encourage their parts suppliers to locate close to their assembly plants. A number of domestic parts manufacturers have become global suppliers, and many are actively considering investments in major markets.

Historically, the Auto Pact was a pivotal point for Canada’s automotive manufacturing sector. By creating a conditional, duty-free manufacturing environment, the Auto Pact and related trade policies led to a fully integrated Canada–U.S. automotive sector. This high level of integration has benefited Canada with efficient world-scale plants and the best market access to the largest automotive market in the world. This position was reinforced by the FTA and the NAFTA, which has extended the level of integration to Mexico such that the North American automotive manufacturing sector is approaching full rationalization.

**New opportunities
for Canadian parts
manufacturers in
emerging markets**

“The auto industry is one of Canada’s most important manufacturing industries, sporting an enormous number of suppliers; but in a new era of continental free trade, Canada will have to work hard to maintain its share of the business.”

— David Crane, *The Next Canadian Century*

New technology reduces model development time, product life cycle

PNGV “Clean Car” will advance technology

New competitiveness imperatives, as well as the gradual reduction of international tariffs and other trade barriers, are creating both challenges to existing customer markets and opportunities for expanding into international niche markets, largely through investment in those locations.

3.2 Technology

In addition to product changes, rapid technological development, stiff competition and affordability pressures are leading OE manufacturers increasingly to demand that parts suppliers take on more system design and development responsibilities. Canadian parts producers have to make basic business decisions about where in the production chain they want to position themselves. Parts firms face an increasing need to develop or acquire leading-edge product design and engineering capabilities to maintain their competitiveness and survive restructuring. This will necessitate greater investment in R&D, skilled labour and capable management.

New automotive technologies are bound to trigger further structural change. Large-scale commercial implementation of machine vision, multimedia, and intelligent design and manufacturing systems may transform the industry dramatically by the year 2000. Already, these technologies have reduced model development lead times from 5–7 years to 3–4 years. It is predicted that product life cycles will be further reduced to 24 months for a facelift and 48 months for a new platform.

The Partnership for a New Generation of Vehicles (PNGV), or “Clean Car,” an R&D partnership established in 1994 involving the U.S. government and the Big Three, is expected to be an important stimulus to technology development. Its goal is to develop within a 10-year period an automobile capable of a fuel economy of 85 miles per U.S. gallon (3.7 litres per 100 kilometres), with a utility, performance and affordability comparable with today’s mid-sized family sedans.

This drive for extremely efficient vehicles is expected to give rise to a range of technological advances, such as new electronics, powertrain and materials technologies, and production methodologies. The Canadian Council for Automotive Research (CANCAR), an R&D consortium of the Big Three in Canada, was established in 1994 to provide a focal point for Canadian involvement in the cooperative initiatives. A few Canadian companies are already contributing to the PNGV, and some others may identify opportunities to join.

The Big Three in Canada have been successful in capturing selected technology mandates, especially regarding alternative fuels; as a result, several Canadian companies have developed proprietary technology in specialized, related areas. Moreover, selected parts firms as well as other current and potential suppliers to the automotive sector have expertise in niche technologies that are being extensively researched and developed in Canada, including hydroforming (shaping metal with water pressure), magnesium parts, fuel cells, continuously variable (CV) transmissions and aluminum vehicle parts.

Another key area of technological development is being driven by demands for greater safety, decreased congestion, and more efficient collection of fees and tolls, known as Intelligent Vehicle Highway Systems (IVHS). The supply factors pushing IVHS include the commercialization of military Global Positioning Systems (GPS) as well as rapid cost improvements in sensor and guidance technologies. A few Canadian electronics firms have leading-edge technologies in this area, and so have good opportunities for developing linkages with non-traditional suppliers.

With respect to their overall presence in a platform, some forecasters see the value of electronics rising from the current 5 percent to up to 25 percent of the total cost of a vehicle. New electronics will be developed and sourced from a new supplier base and, to keep cars affordable, the value of other vehicle inputs will have to diminish.

**Some Canadian firms have
niche technology**

**Sensor and guidance
technology creates
opportunities**

**“It is crucial to our economic
future that . . . our educational
system . . . produce world-
class technologists and
engineers with hands-on
industry experience.”**

**— Robert J. Eaton,
Chairman and CEO,
Chrysler Corporation**

Vehicle affordability remains issue

All of these changing conditions will demand continual adjustments in management, knowledge and skill levels in order for suppliers to keep their competitive edge.

Rapid technological development and diffusion, together with restructuring of the supply chain, will help auto manufacturers reduce production costs and price vehicles to meet the affordability constraints facing consumers. Vehicle affordability will remain an important issue, as consumers' disposable income in North America did not keep pace with the real price increase of vehicles over the past couple of years.

3.3 Sustainable Development

Auto industry builds increasingly more enviro-friendly vehicles

The automotive industry faces growing pressures on a number of environmental fronts: air pollution, traffic congestion, cost of transportation infrastructure and scrappage/landfill practices. All of these affect the way manufacturers design and build vehicles as well as how these vehicles are used by the public.

In response to these pressures, vehicles have generally become smaller, lighter and substantially more fuel efficient, and they incorporate more recyclable materials. The development of environmentally sustainable transportation policies will take on an increasingly important role throughout the world in succeeding decades.

The vehicle and fuel industries in Canada agree on the long-term need to provide appropriate fuels to allow Canadian consumers to benefit from leading vehicle technology and resulting improvement to the environment. There will be an increasing need for these industries to work together to determine appropriate parameters for fuels in Canada to ensure the availability of fuels compatible with these technologies.

The electric vehicle (EV) is of global interest to the automotive industry, both in its own right and as a demonstration platform for innovative technologies that may be applied to other vehicles in such areas as lightweight materials and energy storage and management systems. Canada has the potential to take a leadership position in EV technologies with the Ballard fuel cell, which is currently being demonstrated in buses for use in mass transit. As well, Chrysler Canada in 1995 announced the development of an electric model of its minivan. GM Canada will be field testing the EV1 model in Vancouver, British Columbia, in 1996 under its PrEView program. The two major constraints to the production of EVs remain the battery, in terms of range and recharging time, and the support infrastructure to recharge and maintain a large population of electric vehicles.

Also under development are hybrid electric vehicles (HEV), which contain two power sources: an engine or fuel cell, and a second source such as a flywheel or battery to augment power for quick acceleration or climbing. Canadian niche technologies may also find opportunities in these vehicles. The Electric Vehicle Association of Canada is a focal point in these considerations.

3.4 Harmonization

To reduce testing and certification costs for both manufacturers and government, the *Motor Vehicle Safety Act* explicitly allows vehicle certification under an accepted foreign standard as proof of compliance in Canada. As a result of this approach, the majority of Canadian safety standards are harmonized with those applicable in the United States. Diverging safety standards are generally a reflection of specific Canadian developments, such as those related to seatbelts and daytime running lights, or bilingual and metric legislative requirements. Similarly, Canada has harmonized national emission standards with U.S. federal emission standards under the Environmental Protection Agency since 1985.

Canada has a leadership position in EV technology

Canada harmonizes its safety and emission standards with U.S.

The Automotive Standards Council was established under the NAFTA to facilitate the attainment of compatible national standards related to automotive goods and emissions. The three governments recognize the importance of compatible standards, not only from the point of view of containing manufacturing costs, but also for removing potential trade irritants. In June 1996, the Automotive Standards Council announced the formation of four working groups together with their terms of reference. The four working groups cover Emission/Engine/Fuels, Light Vehicle Safety Standards, Heavy Vehicle Safety Standards, and Parts and Equipment (both OE and aftermarket). The industry has been invited to participate directly in these working groups.

On October 23, 1995, the Canadian Council of Ministers of the Environment (CCME) recommended the adoption of a national approach for setting vehicle emission and related fuel standards. The CCME also reconfirmed Canada's commitment to the harmonization of Canadian and U.S. federal emission standards and availability of compatible fuels, and work is currently under way to implement these recommendations. British Columbia, however, in response to air quality concerns, has introduced a provincial environmental program that regulates vehicle emissions and fuel standards.

3.5 Human Resources

Both the assembly industry and a substantial element of the components industry require a relatively highly skilled work force, and labour training is crucial to higher labour productivity and a competitive labour force. Requirements are increasing as product and process technologies become more sophisticated. Training and the availability of an appropriately skilled work force are viewed as high-priority issues by these industries.

Both industries engage in significant ongoing training of their employees, and this activity is expected to continue to increase. However, particularly heavy requirements for training surround major investments in either industry, where current and new workers must acquire facility with new technology in a new or reconfigured work environment. In these circumstances, costs and associated risks are relatively high. Government support is sought, and the location of such investments can be swayed by the availability of such support. Competing jurisdictions in the U.S. offer a range of major incentives including grants/contributions for training. This issue impacts on the competitiveness of Canadian plant sites, since there is no operational mechanism in either the parts or the assembly industries for accessing potential federal support for training current employees for such investments.

Currently, there is a domestic shortage of skilled trades required by parts manufacturers. The disequilibrium in this segment of the labour market is causing efficiency losses, higher turnover rates and artificially low limits on the level of quality that could be achieved. Without the proper mix of skills required to develop subsystems for the OE manufacturers, there is reduced scope for some parts manufacturers to become Tier One suppliers or even to expand operations in Canada based on technology acquired elsewhere.

With respect to job opportunities in the future, a study commissioned by the Michigan Jobs Commission (*Driving America's Renaissance: Human Resource Issues in Michigan's Automotive Industry*, 1996) noted that, between 1995 and 2003, there will be approximately 191 000 retirees from the Big Three throughout the United States. It is estimated that this will result in 168 000 new hires over this period. Thus tremendous opportunities will exist for youth in replacing the retired workers. There will also be proportional opportunities in Canada, with a few years lag due to the later maturation of the Big Three's presence in Canada relative to the United States. The challenge will be to ensure that youth are attracted to and prepared for these positions encompassing both production line jobs in the assembly industry and skilled trades in the parts industry.

Parts manufacturers need skilled tradespeople

Opportunities exist to replace aging labour force

Cost of regulation is under review

Cost-cutting pressures have led OE manufacturers to outsource an increased portion of parts from independent suppliers. This has resulted in some tensions with the labour unions, which want to preserve high-paying, unionized positions in the affiliated facilities. In the Big Three's contract negotiations with the UAW/CAW coming up in late 1996, the two major issues are expected to be outsourcing and retirement benefits.

3.6 Regulatory Reform

In November 1994, the federal government announced in its policy document *Building a More Innovative Economy* (Supply and Services Canada, 1994) that sectoral regulatory reviews would be conducted in the automotive and forestry sectors as well as in four others. Since then, the Business Impact Test (BIT), which was developed by Industry Canada and Treasury Board with the Canadian Manufacturers Association (CMA), has been used with the automotive sector in a consensus-building exercise to get agreement on key regulatory problems. The key issues arising from this analysis are taxation harmonization, technical standards and the Workplace Hazardous Materials Information System (WHMIS).

In addition, some other issues were identified, such as cost of government information requests, harmonization of technical standards across North America, consolidation of tax audit function within the various federal taxing areas, the environmental approval process, hours of work, work refusals and tax cascading in the Canadian manufacturing environment.

Firstly, the lack of harmonization of federal and provincial sales tax regulation and the cost of carrying Goods and Services Tax costs on exports introduce costs that, if addressed, would lead to considerable savings. Secondly, the automotive sector has given high priority to improving the dispute resolution process used in dealing with technical safety issues related to motor vehicles. Lastly, improving WHMIS is being given high priority by the automotive sector. WHMIS legislation interacts with or parallels a number of other pieces of federal legislation such as the *Canadian Environmental Protection Act* and provincial legislation. The industry finds that the various WHMIS information requirements do not mesh effectively with others, thus adding unnecessary costs.

3.7 Market

The Canadian automotive sector is currently at a crossroads. While Canadian light vehicle production in 1995 was at a record 2.4 million units, domestic sales were below 1.2 million units, down from a high of 1.6 million units in 1988. The domestic sales market has declined in six of the past seven years. Over the long term, the Canadian light vehicle market has averaged about 9.5 percent of U.S. volumes. The 1995 Canadian market was the weakest since 1983, while the Canadian share of the U.S. market (7.7 percent) was the lowest since 1971. Weakened Canadian sales relative to the U.S. sales make it much harder to hold product mandates for Canadian vehicle assembly operations.

3.8 Product Mandates

The decisions surrounding where light vehicle models are built in North America are complex and solicit a fair amount of competition among the regional operations of the parent companies. In this regard, the Canadian automotive sector has been in a strong competitive position. Over the past couple of years, the Canadian assembly industry has benefited from some very strong product mandates. However, competitive demands, combined with streamlining of the product design process, are leading to shorter product cycles.

Canadian plants continue to win strong mandates

**“For most of us, the car-
owning experience, from
purchase to maintenance, is
our most expensive budget
item, second only to the
purchase of a home.”**

— Autopinion 1994

In order for plants to remain competitive in a short product cycle environment, they must keep costs down while maintaining product quality within a highly adaptive manufacturing/production regime. In this context, it is crucial for the Canadian assembly industry to remain competitive in order to continually win renewed mandates, as the associated investment is derived from foreign sources with no inherent commitment to Canada. In the past, Canada has fared well, receiving a share of capital expenditures in assembly much larger than its Canada–U.S. production share of 17 percent. Between 1986 and 1992, capital expenditures in motor vehicle assembly have averaged approximately 30 percent of total annual Canada–U.S. expenditures.

Similarly, given the cost pressures being exerted on the supply chain, parts manufacturers in Canada will have to enhance their competitiveness continuously.

3.9 Distribution and Marketing

The distribution and marketing of light vehicles is an area impacting on the cost of the product to the consumer and his/her satisfaction with the purchase and ownership experience. While the importance of these issues is recognized and appreciated, they are not covered in this document, which focusses on the manufacturing sector and not on the retail sector.

4 GROWTH PROSPECTS

Emerging economies, where current growth rates average between 6 and 11 percent, are becoming fertile ground for new automotive business. However, many of these countries still have restrictive trade regimes in order to foster a domestic automotive industry. This, coupled with the regionalized production of the automotive industries, will limit the ability of Canadians to export automotive goods beyond North America. Clearly, the U.S. is expected to remain the major market for Canadian parts and vehicles in the near term.

Nonetheless, there still exist some opportunities for expansion into international niche markets. Penetration of new markets requires the possession of proprietary product or process technology as well as significant investments of time and capital. The diversification benefits of targeting niche opportunities in emerging world markets are understood. However, the Canadian industry also recognizes the cost-benefit of tackling these markets, compared with the risk-reward of solidifying its North American position. Canadian firms' success in exploiting opportunities in these markets will largely hinge on partnerships with parent companies and other major players.

A number of additional factors present other growth prospects for the Canadian automotive industry. Firstly, falling non-tariff barriers between developed countries constitutes one opportunity. The 1995 U.S.–Japan trade agreement on autos has been designed to improve market access to Japan and to expand sourcing opportunities with Japanese companies. Measures to be taken are intended to encourage imports of foreign automobiles and parts to Japan, increase parts sourcing by Japanese assemblers overseas and increase aftermarket opportunities by deregulating the aftermarket in Japan for replacement parts and accessories. Secondly, free trade zones such as the NAFTA, which provide for duty-free trade in auto products if certain regional content requirements are met, will create further export potential for Canadian assembled vehicles and parts with the phase-out of the Mexican Auto Decree, scheduled by 2003.

**U.S. remains major
market for Canada**

**International niche markets
attract some Canadian firms**

**Falling non-tariff barriers
and free trade zones
herald opportunities**

**Canadian auto assembly
industry must maintain
competitiveness**

Also, negotiations are currently under way for a bilateral free trade agreement between Canada and Chile, in anticipation of the accession by Chile to the NAFTA. Lastly, global sourcing practices by the world's OE manufacturers present both prospects and challenges. Foreign markets, which were once inaccessible to Canadian parts companies because of industry structure, are opening up to these new practices. However, the corollary is stiff competition for current business. Opportunities will exist only if Canadian parts companies are globally competitive on a cost/quality basis.

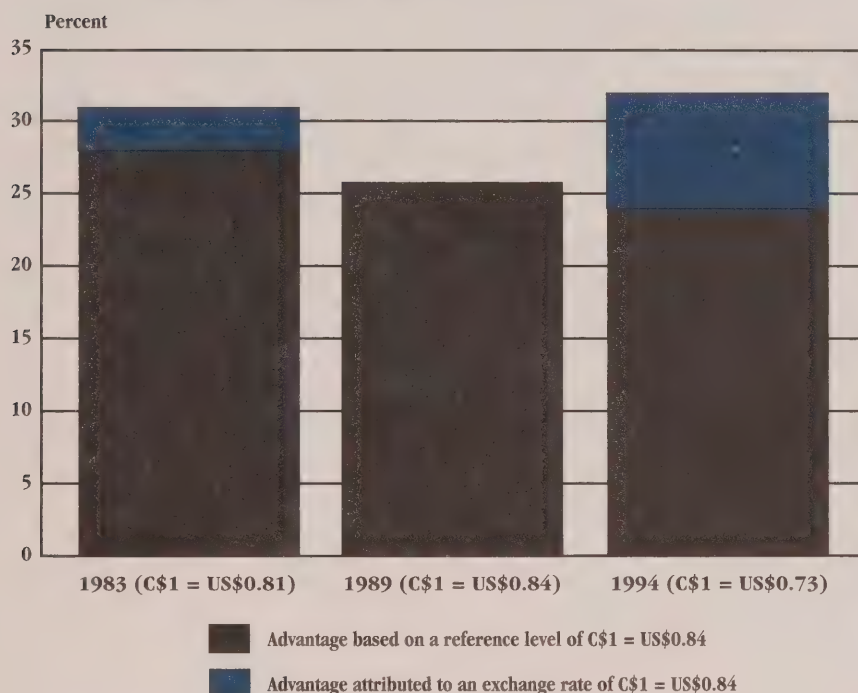
Most forecasters expect limited growth in the Canada–U.S. passenger car market but continued growth in light trucks, especially sport/utility vehicles. On the production side, many Canadian plants have either new or existing product mandates for vehicles that have been North American bestsellers, and are expected to maintain this status for the short to medium term.

4.1 Assembly Industry

Currently, the Canadian assembly sector is highly successful. Vehicle assembly output is twice the level of domestic consumption, and over 90 percent of shipments are exported. Contributing to this success are a number of excellent product mandates, good labour/management relations, strong manufacturing capabilities, a significant unit assembly cost advantage over U.S. counterparts and excellent quality. A favourable micro-economic climate in Canada has also been a contributing factor.

However, some of the key components of Canada's current labour cost advantage vis-à-vis the U.S., such as lower health care costs for Canadian assemblers and a favourable exchange rate (Figure 11), may not constitute long-term sustainable advantages. Should significant changes occur in these key components, some erosion of Canada's share of North American assembly could occur.

Figure 11. Changing Labour Cost Advantage of Canadian Assembly Plants Over U.S. Counterparts



Source: Harbour and Associates, Inc., *The Harbour Report*, 1995;
Industry Canada estimates based on data provided by companies.

Consequently, concerted action is needed by industry and governments to foster the maintenance of existing advantages, continuous improvement in all production factors, and competitiveness in other elements of the investment climate.

4.2 Components Industry

The Canadian parts industry is cost competitive with the U.S. on the basis of both existing plants and new plants. Strong gains were made during the 1980s, and the share of the Canadian parts industry of the combined Canada–U.S. market nearly doubled from 8.1 percent in 1982 to over 15 percent in 1995. Despite annual average growth of over 5.3 percent in production over the past decade, Canada still has a persistently high parts trade deficit arising from even faster growth in the vehicle assembly industry.

Asian builders are expected to source more parts in North America in response to the high valuation of the Japanese yen relative to North American currencies as well as to meet rising North American value-added (NAVA) criteria for liberalized trade under the NAFTA. Recently announced expansions of Asian assembly capacity in Canada will provide further opportunity for Canadian parts producers.

To gain more of this business as well as a greater share of the opportunities accruing from the anticipated increase in outsourcing by some or all of the Big Three, Canadian parts suppliers need to increase their design and development capabilities, diversify their product range and actively pursue these business relationships.

“The lack of R&D in the Canadian parts sector adversely affects prospects for competitiveness . . . very few Canadian parts firms . . . have a technology strategy of innovation. . . .”
— Science Council of Canada, 1992

Canadian parts production is challenged by Mexican and offshore production in products of less complexity requiring lower technological sophistication and labour skills. At the high end, the market is dominated by U.S., Japanese and European multinational firms. The Canadian share has largely been in the middle range. These tend to be larger products of medium sophistication that are more expensive to ship and that must therefore be made within 1000 kilometres of the assembler.

The challenge for the Canadian parts industry is to carve out as much business as possible from this middle ground and to move into the higher end of systems subassembly work.

4.3 The Bottom Line

What's in store for the Canadian automotive sector for the short to medium term? Given the structure of the Canadian assembly industry, which for the most part supplies the North American market, North American consumer purchasing patterns and Canadian product mandates offer some key insights.

Canadian assembly plants have been fortunate in the mandates they have acquired. In 1995, some 48 percent of passenger car production and 82 percent of light truck production in Canada was among the 15 bestselling cars and light trucks in the United States. This production involved five out of nine Canadian passenger car facilities and four out of six of the Canadian light truck facilities. Meanwhile, there is constant competition between regional operations for new and existing mandates that are expected to be, and are, successful.

Less robust market performance for the models produced in the other Canadian facilities brings into focus the ongoing certainty of platform and model changes as well as accompanying mandate revisions and the continuing requirement for a business climate sufficiently competitive to attract the new mandates.

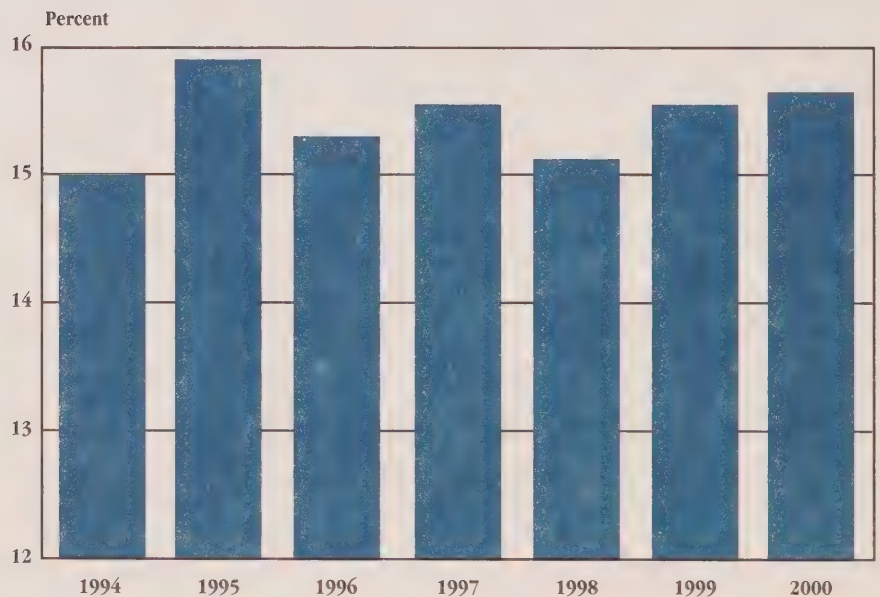
Product design and development capabilities need strengthening

Canada produces bestselling light trucks and vans

According to J. D. Power and Associates (*The U.S. Automotive Outlook*, 1996), the only U.S. market segment “gainers” in the 1992–95 period were: sport/utility vehicles, lower middle passenger cars, pickups and vans. The real growth in sales has been in the sport/utility category. In 1995, this category grew by 3 percent and the trend is expected to continue. In Canada, sport/utility vehicles and small luxury cars were the only segments to experience an increase in sales for 1994–95. Growth in Canadian sales is forecast to be modest to the end of the decade. The leading vehicle segments in this growth are projected to be sport/utility vehicles, small luxury passenger cars, vans and pickups. The CAMI facility, Canada’s only plant with a mandate for sport/utility vehicles (representing approximately 40 percent of its current production), may be able to profit from this trend.

In the pickup and van categories, Canadian plants produce six of the 1995 top 15 bestselling light truck models in the United States. These are broken down into three full-sized pickups (Ford’s F-Series, and GM’s C/K and Sierra) and three vans (Chrysler’s Caravan and Voyager, and Ford’s Windstar). Anticipated firm sales in these categories bode well for Canadian production (Figure 12).

Figure 12. Anticipated Stable Share of North American Light Vehicle Production by Canadian Plants



Source: Wexford Management Consultants, April 1996.

The Canadian automotive assembly industry currently is performing strongly, given the forecast stability of the Canadian dollar vis-à-vis U.S. currency, an improving balance of trade in automotive goods, a relatively stable forecast share of North American production and the commitment by both federal and provincial governments to continued deficit reduction. However, given the reliance on external investment as well as dependence on export markets, and in view of the shortening of the product cycle, every effort must be made to maintain a competitive Canadian business climate and industry environment to ensure that Canadian plants are the recipients of renewed and new mandates and the associated investment.

**Assemblers are
performing strongly**

The annual real growth in parts shipments is expected to slow for the short term. Industry restructuring efforts are expected to continue as suppliers work to streamline and strengthen their operations. Specifically, over the medium term, automakers will continue to place even greater pressure on their suppliers for higher quality and lower costs. The auto industry will also see a move toward “commonization” of parts, as automakers work to achieve production flexibility and significantly lower costs by linking various car models with a higher percentage of common parts. In short, the Canadian parts industry could experience further consolidation. Restructuring by the automotive components group of the Big Three and their continued efforts for increased outsourcing could be affected by the result of the negotiations associated with the ending of the three-year CAW contracts reached in fall 1993.

Parts sector is growing

While the overall Canadian automotive sector is currently in a reasonable position, a number of critical issues could affect its future competitive position. The issues facing the industry must not be examined in isolation but rather as part of Canada’s overall automotive policy. Consequently, the government plans to begin a review of Canada’s automotive strategic policy framework within the next year, in full consultation with all stakeholders, with a view to maintaining the competitiveness of the automotive sector in Canada.

**Need to maintain
competitive micro-
economic climate**

**Automotive strategic policy
framework will be reviewed**

This Sector Competitiveness Frameworks document on the *Automotive Industry: Part 1 — Overview and Prospects* has been prepared as a basis for further discussion of issues and resolutions with key stakeholders. The outcome of the discussions will be published in *Part 2 — Framework for Action*.

For further information concerning the subject matter contained in this Overview, please contact:

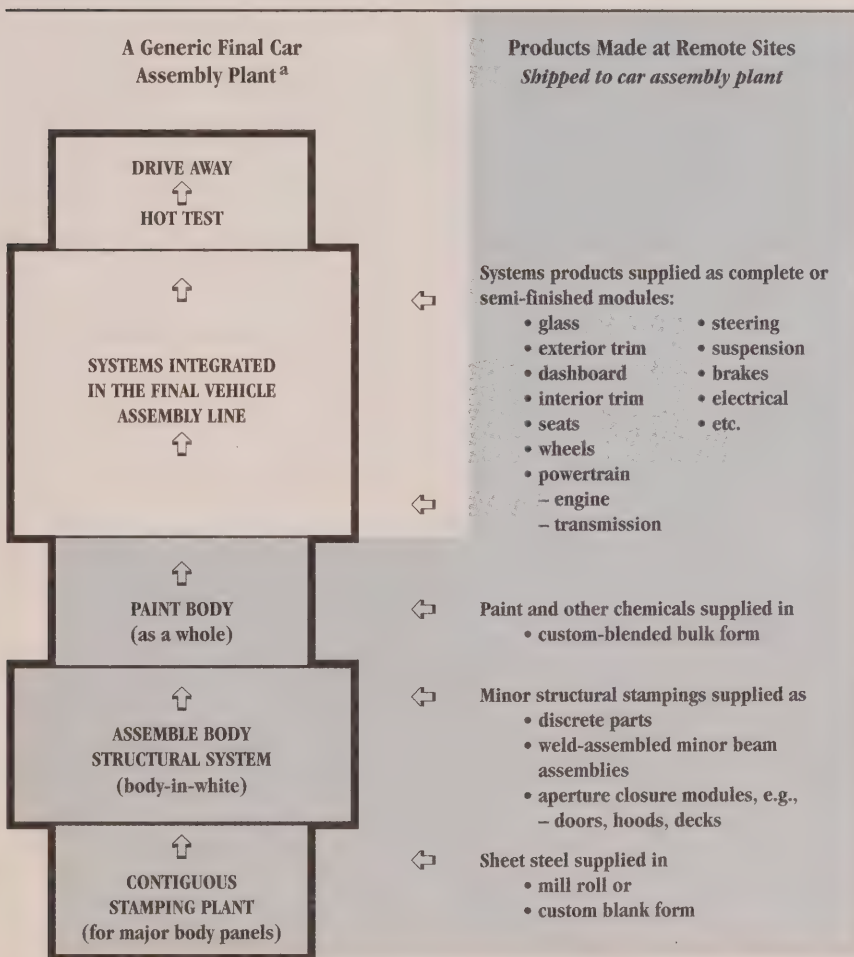
Automotive Branch
Industry Canada
Attention: Mike Marshall
235 Queen Street
OTTAWA, Ontario
K1A 0H5
Tel.: (613) 954-3709
Fax: (613) 952-8088
E-mail: automotive.scf@ic.gc.ca

Annex A

HOW A CAR IS PRODUCED

An automobile is a complex product made through complex processes. A typical high-volume car may consist of close to 12 000 individual parts requiring as many as 3500 separate manufacturing drawings. Essentially all of the parts included in an automobile first come together as elements of a distinct system, such as engine, transmission, body, steering, brakes and electronics. Automotive assemblers are increasingly becoming systems integrators of the various components and systems supplied by parts manufacturers (see Figure A-1).

Figure A-1. Vehicle Production Process



^a Assumed: Adequate sales volume for full-scale plant operation.

To supply the various systems and components to the assemblers, the parts industry is organized along a three-tiered structure. A Tier One producer is normally characterized as a systems developer, directly supplying the automotive assembler. The Tier One producer usually owns proprietary rights to one or more systems and is responsible for product design, R&D, production, validation, warranty and supply chain management. Tier One producers can be either independent companies (e.g. Magna, Siemens, Hayes-Dana) or affiliated producers owned by the assemblers (e.g. Delphi, Mopar).

A Tier Two manufacturer builds discrete parts or subsystems and supplies these to independent or affiliated Tier One producers. The majority of components companies in Canada fall into the Tier Two category. The last classification is Tier Three, which essentially comprises suppliers of raw materials and services. All car companies normally perform assembly and key Tier One operations. Further corporate integration varies significantly and may include Tier Two facilities. General Motors, for example, produces about 70 percent of its components in-house, compared with 30 percent for Chrysler.

Annex B

COMPONENTS INDUSTRY RESTRUCTURING

A key determinant of future industry transformation will be the degree of further adoption of outsourcing. Under this approach, assemblers focus on their core competencies relative to the proprietary look and feel of the vehicle, and outsource other elements to lower-cost producers. This strategy leads to the further development of a hierarchy among parts producers: more design, development and systems validation functions are outsourced to Tier One suppliers, and further consolidation is triggered in upstream Tier Two suppliers. The approach also entails joint product development and has led to the creation of successful platform teams.

The vertically disintegrated approach called for under the outsourcing model results in an inherently lower cost structure. There is little doubt that this restructuring and rationalization will proceed in North America; in fact, affiliated plants have already been sold to expanded Tier One suppliers. What remains to be seen is the ultimate extent to which outsourcing will proceed, as doing so requires drastic changes in assembler–supplier relationships. A lot depends on the attitudes toward intellectual property. Will the car companies, which now create most of the systems technology in-house, trust this responsibility to independent systems suppliers? Will the latter see sufficient rewards to risk and make the investment necessary to develop these systems?

The bulk of necessary outsourcing and rationalization is expected to be completed by the end of the decade, after which it will be difficult for new or late entrants to displace those firms that will have succeeded in becoming core suppliers to the assemblers. The longer-term relationships of the companies that survive restructuring will be further solidified by the greater importance of proprietary intellectual property, developed and retained by the newly empowered Tier One companies.

The evolution of the tier structure will also require Tier Two companies to develop a new set of business relationships. In the past, most parts suppliers dealt directly with the assemblers; however, the changing structure of the industry will necessitate greater linkages with Tier One producers. Tier Two suppliers will also be faced with strong competitive demands, as they are competing almost exclusively on their processing ability. This increases business risk and necessitates a continual focus on more productive manufacturing processes.

Annex C

TARIFF STRUCTURE FOR CANADA, THE UNITED STATES AND MEXICO, 1996

Canadian Tariff Rates		
Auto Pact:	<i>Free</i>	for vehicles and original equipment (OE) parts for participating companies
Most Favoured Nation:	8.0%	for vehicles and aftermarket parts ^a
	<i>Free</i>	for OE parts and parts of OE parts
	9.2%	for tires and rubber products
General Preferential Tariff:	6.0%	for most automotive goods
NAFTA (from the U.S.):	1.8%	(free by 1998)
	<i>Free</i>	for aftermarket parts
NAFTA (from Mexico):	2.3%	for cars (free by 2003)
	1.5%	for light trucks (free by 1998)
	2.4%	for 75% of parts (free by 1998)
	4.2%	for 25% of parts (free by 2003)
	<i>Free</i>	for engines
U.S. Tariff Rates		
Most Favoured Nation:	2.5%	for passenger cars
	3.1%	for buses
	25.0%	for trucks
	4.0%	for road tractors
	3.0%	for parts ^b
NAFTA (from Canada):	<i>Free</i>	for automotive products from Canada meeting the NAFTA rule of origin
Generalized Special Preference:	<i>Free</i>	for imports from specific developing countries (not applicable for imports from Canada)
Mexican Tariff Rates		
Most Favoured Nation:	20%	for vehicles
	15%	for parts (average rate)
NAFTA (from Canada):	8.0%	for cars (free by 2003)
	6.0%	for light trucks (free by 1998)
	6.0%	for other vehicles (free by 2003)
	6.0%	for 75% of parts (free by 1998)
	10.5%	for 25% of parts (free by 2003)
^a During the Uruguay Round of multilateral trade negotiations under the General Agreement on Tariffs and Trade, Canada agreed to reduce the tariff applicable to automotive goods imported from countries having Most Favoured Nation status from 9.2% in 1994 to 6.1% in 1999. This reduction is being phased in over five years. The reduction schedule is as follows: 7.3% in 1997, 6.7% in 1988 and 6.1% in 1999.		
^b However, through the use of foreign trade zones, the applied rate of duty for parts used in the manufacture of passenger cars is 2.5%.		

Annex D

CANADIAN LIGHT VEHICLE ASSEMBLY PLANTS

Assembler/Location	Product	1995 Output (units)	1995 Employment ^a
CAMI Automotive Inc.			
Ingersoll, Ontario	Geo Metro/Tracker, Suzuki Swift/Sidekick	193 570 ^b	2 676
Chrysler Canada Ltd.			
Bramalea, Ontario	Concorde, Intrepid, LHS, New Yorker, ^c Vision	188 732	3 046
Pillette Rd., Ontario	Ram Van/Wagon	74 163	1 947
Windsor, Ontario	Voyageur, Caravan, Caravan C-V	275 202	6 274
Ford Motor Company of Canada, Ltd.			
Oakville, Ontario	Windstar	243 785	3 486
Oakville, Ontario	F Series Trucks	82 409	1 042
St. Thomas, Ontario	Crown Victoria, Grand Marquis	207 249	2 731
General Motors of Canada, Ltd.			
Oshawa #1, Ontario	Lumina/Monte Carlo		3 299
Oshawa #2, Ontario	Lumina, Regal	462 749 ^d	3 524
Oshawa Truck, Ontario	C/K Truck, Sierra	285 246	3 978
Sainte-Thérèse, Quebec ^e	Camaro, Firebird	159 838	2 981
Honda of Canada Manufacturing, Inc.			
Alliston, Ontario	Civic	106 133	1 909
Toyota Motor Manufacturing Canada, Inc.			
Cambridge, Ontario	Corolla	90 136	1 050
Volvo Canada Ltd.			
Halifax, Nova Scotia	940 Series/850 Series ^f	7 627	200
^a Hourly and salaried as at December 31, 1995; GM employment numbers are for 1994. ^b As estimated by Ward's Automotive Reports. ^c As of September 1995, Chrysler no longer produces a New Yorker. ^d Represents production for both Oshawa #1 and #2. ^e GM laid off 1 400 workers on October 1, 1995. ^f As of July 1995, Volvo no longer produces the 940 Series. Source: Ward's Automotive Reports; Harbour and Associates, Inc., <i>The Harbour Report</i> , 1995; industry sources.			

